R E P O R T R E S U M E S

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STATE OF NEW YORK STANDARD SCHOOL PLAN TYPE D-1, ONE-STORY JUNIOR-SENIOR HIGH SCHOOL 800 EXPANDABLE TO 1000 PUPILS.

NEW YORK STATE EDUCATION DEPT., ALBANY
MARSH (REGINALD E.) AND ASSOCIATES, NEW YORK, N.Y.

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DESCRIPTORS- *HIGH SCHOOL DESIGN, *JUNIOR HIGH SCHOOLS, *SCHOOL LOCATION, *SENIOR HIGH SCHOOLS, SCHOOL CONSTRUCTION, SCHOOL EXPANSION, SCHOOL SPACE,

THE DESIGN OF THIS ECONOMICALLY PLANNED SCHOOL IS DEVELOPED TO SUIT A GENERALIZED SET OF AREA CHARACTERISTICS. PHYSICAL SEPARATION OF JUNIOR AND SENIOR PUPILS IS EFFECTED THROUGH USE OF THE "SCHOOLS-WITHIN-A-SCHOOL" PLAN. PROVISIONS FOR ADOPTION OF--(1) TEAM TEACHING, (2) MACHINE TEACHING, (3) EDUCATIONAL TELEVISION, AND (4) AURAL-ORAL LANGUAGE LEARNING ARE MADE THROUGH CLASSROOM CONVERSION POTENTIAL AND THE DESIGN OF AN ELECTRONIC TEACHING CENTER. EMPHASIZED AS PROJECT CONSIDERATIONS ARE--(1) MODULAR DIMENSIONING, (2) EXPANSION DATA, (3) CONSTRUCTION AND FINISH MATERIALS, (4) STRUCTURAL DESIGN, AND (5) MECHANICAL SYSTEMS. FLOOR PLANS AND PERSPECTIVES ARE INCLUDED. (MH)

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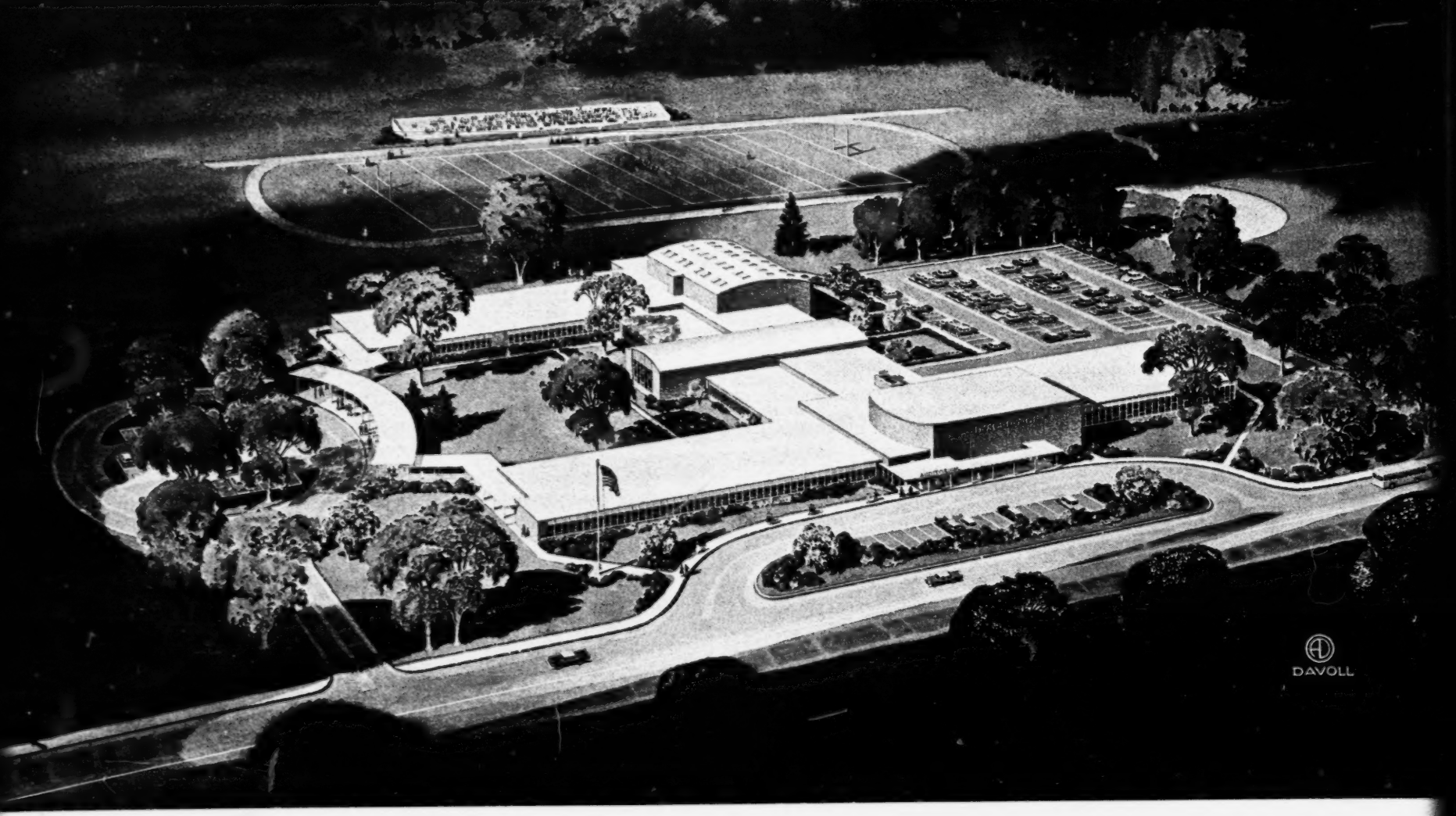
STATE OF NEW YORK
STANDARD SCHOOL PLAN
TYPE D-I



EXPANDABLE JUNIOR-SENIOR HIGH SCHOOL 800 TO 1000 PUPILS

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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STATE OF NEW YORK

STANDARD SCHOOL PLAN
TYPE D-1, ONE-STORY
JUNIOR - SENIOR HIGH SCHOOL
800 EXPANDABLE TO 1000 PUPILS

-REPORT-

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PREFACE

The development of a standard plan for a school building of any type is a challenge to the architect as well as the educational consultant. This is especially true for a junior-senior high school during this period of educational change when the merits of such methods as team teaching, machine teaching, educational television, and aural-oral language learning are being widely discussed. Although each of these is in an experimental stage, not many communities are ready to undertake these experimental programs. Consequently, a standard plan should be one that will not only meet present day requirements but also provide for adaptation to tomorrow's programs.

The problem in planning a new building is not limited to the educational facilities and their use. There are basic conditions that must be given consideration, such as adaptability both to the climate as well as other environmental factors. In addition, consideration must be given to the possibility of variations in site conditions, orientation, and accessibility from highways. Finally, economical planning is essential to meet possible site restrictions and budget limitations.

EDUCATIONAL FACILITIES
AS PROVIDED IN
PLAN TYPE D-1

These correspond satisfactorily to the recommendations of the State Education Department, and as modified in conference with other educational and architectural advisors.

TEACHING SPACES

No.	Title or Use	Comments
2	Industrial Arts	Storage Additional
2	Homemaking	
2	Arts and Crafts	
2	Science	
2	Science	Sr. High Wing
2	Science	Jr. High Wing
2	Business Education	
1	Music	Suite
8	Sr. High Classrooms	
9	Jr. High Classrooms	
1	Library	Related Areas
1	Study Room	
1	Auditorium	Capacity 514
1	Double Gymnasium	Shower, Lockers
1	Audio-Visual	

FUTURE EXTENSION

2	Senior Classrooms
2	Junior Classrooms
1	General Science
1	Agriculture and Recitation

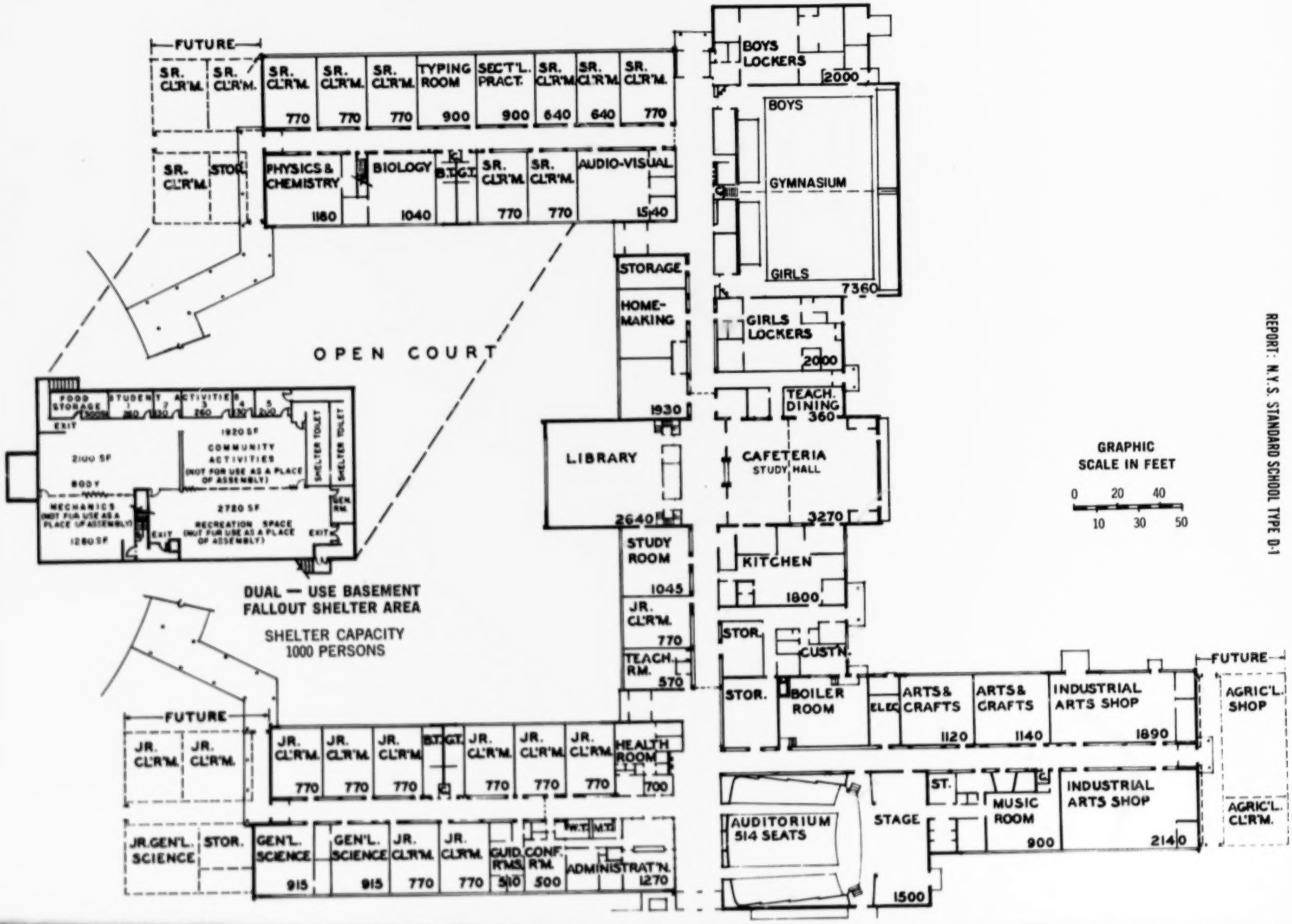
ADMINISTRATIVE, PERSONNEL & COMMUNITY SPACES

No.	Title or Use	Comments
1	Administration	Suite
1	Conference	
1	Guidance	Suite
1	Health	Suite
1	Cafeteria	Study Hall
1	Teachers Dining	
1	Kitchen	Related Areas
1	Teachers' Room	

DUAL USE SHELTER AREA

2	Toilets
1	Generator Room
1	Body Mechanics Area
1	Community Activities Area
1	Recreation Area
5	School Club Rooms
1	Food Storage

NOTE: The areas of all spaces noted above can be found in the floor plans.



REPORT: N.Y.S. STANDARD SCHOOL TYPE D-1

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THE EDUCATIONAL BLUEPRINT OF THE PROPOSED SCHOOL

General Planning

The proposed secondary school has been conceived as a school which will provide for all of the secondary school pupils of the district attending the public schools. Accordingly, the school will house the programs both for early secondary school education, that is, the junior high school program, as well as the later secondary school education or senior high school.

In purpose, the program of early secondary education is primarily one of orientation and guidance while the program of later secondary education is designed to provide both for terminal education as well as foundation programs which are continued in post-high school institutions.

The general plan as well as the facilities included in the building have been designed to accomplish these purposes within the limits of the size of the school enrollments anticipated and the cost framework established.

The Over-All Plan

Because of the size and character of the pupil population to be served in the school under consideration, the building has been planned so as to incorporate some of the main features of the "schools-within-a-school" plan. The basic principle of this plan is to divide a school's population into smaller units and to house these units so as to provide for as much physical separation as possible. Since the proposed building is to house from 800 to 1,000 pupils in grades 7-12, use of this plan is particularly desirable. First, it creates smaller and more desirable organizational units. In addition, it serves to separate pupils who differ greatly in their social, psychological and physical development.

In the proposed building, provision has been made for the separation of the school's population into two groups, a grade 7-9 or junior high school group and a grade 10-12 or senior high school group. Accordingly, all of the facilities included in the program of requirements established for the school have been divided into three general groups as follows:

1. Those used exclusively by the junior high school grades.

2. Those used exclusively by the senior high school grades.

3. Those used jointly by both groups.

It is evident that the smaller the school organization serving grades 7-12, the greater the number of facilities that would need to be in joint use by both grades 7-9 and grades 10-12 unless,

of course, a school district is financially able and willing to absorb the cost of a certain amount of duplication. However, this does not appear to be practical or possible in most school districts of the State of New York. Accordingly, for this school, the basic principle of the "schools-within-a-school" plan has been compromised to the extent that only those facilities which would be used exclusively are included in separate wings which will house grades 7-9 and grades 10-12. The facilities which would need to be used jointly by both groups have been located in a central core readily accessible to both groups. The distribution of the three types of facilities is as follows:

Facilities Used Exclusively by:		Facilities Used Jointly by:
Junior High School	Senior High School	Both Schools
Regular Classrooms	Regular Classrooms	Library
		Study Room
		Industrial Arts
General Science	Chemistry-Physics	Homemaking
		Music
		Gymnasium
	Biology	Cafeteria
		Auditorium
	Typewriting	Health Room
		Guidance Office
	Secretarial Practice	Art
		Audio-Visual
		Language Laboratory

In planning the building, the art, industrial arts and musical facilities have been located in close proximity to the junior high school wing since these subjects are required in the grade 7 and 8 program. Thus, all activities of the grade 7-9 group except physical education and homemaking have been localized. Since these facilities generally have only limited use by grade 10-12 pupils on an elective basis, the maximum of separation of the upper and lower groups will have been effected. All upper high school grade subject matter will be localized in the upper school wing with the exception of those who may elect subjects in the fine and industrial arts. The study room and audio-visual teaching center has been located close to the upper school wing since they will be used more widely by those pupils.

The cafeteria has been designed so that the dining room may be divided into two separate areas thus permitting separation of the two age groups.

PROVISION FOR CHANGES IN TEACHING METHODS

General

Since the useful life of a school may be considered to be around 50 years, it is important that consideration be given to possible changes in teaching methods during this period which in turn could influence the character of the school plant. Although no one can predict with certainty the nature of these changes, it can be assumed that some changes will inevitably occur. Accordingly, schools should be designed to permit future conversion. Carried to its ultimate, this could indicate the open loft type of construction with all interior subdivisions being determined by current needs. The interior partitioning initially installed should be easy to relocate so as to provide the type of space required at any given time. Design and construction of this type would present no particular problem in those sections of a building which house academic subjects. However, those portions of the building which house subjects requiring special types of equipment which must have mechanical and electrical connections will present greater altnough not insurmountable problems. Accordingly, in the junior-senior high school standard plans, every effort has been made to design with as much provision for flexibility as is possible without materially increasing costs.

There are, however, certain newer approaches in secondary education which are sufficiently promising as to suggest the desirability of anticipating their more general adoption. Accordingly, provision for their future use has been made possible in the plans. These will be discussed briefly in the sections which follow.

Provision for a Team Teaching Program

The team teaching method combined with large group instruction is prominently mentioned in current educational literature. This method is not essentially new to the educative process. It is a method of organization which has been used in the colleges for many years. It rests largely upon the thesis that the abilities of the most competent teachers must be capitalized upon more fully than at present. Thus, instead of being assigned to individual classes of 25 to 30 pupils each, instruction through this method provides that new topics, units and concepts are introduced in a large instructional group of 100 or more students essentially by the lecture method. This would be followed by discussion in smaller groups, which might range from 12-15 pupils in which the assistant teacher assigned would attempt to sharpen understandings, probe areas of agreement and disagreement, solve problems, etc. This plan which is proposed by Dr. Lloyd Trump[1], for use in secondary schools, would require

[1]Director of the Commission on the Experimental Study of the Utilization of the Staff in the Secondary Schools; appointed by the National Association of Secondary School Principals.

a great deal more individual work to be undertaken by students such as reading, listening to records and tapes, writing, recording, and experimentation. Students would assume more individual responsibility for learning than under more conventional methods. It would involve conferences between students and instructors whenever these were necessary.

In this program, the school would not have standard classes of 20 to 25 pupils, meeting five days a week on inflexible schedules. Both the size of the classes and the length of the periods will vary from day to day. Similarly, methods of teaching, student groupings, teacher and student activities will adjust to the purposes and content of instruction.

In Dr. Trump's opinion, the implementation of this program would require a different physical environment than currently existing in the conventional high school. Because class groups would vary in size, provision must be made for groups of varying size, as for example, small groups of 10 to 15 pupils, groups of 20 to 30 pupils and for groups as large as 100 to 150 pupils. Also, it is proposed that study-resource centers be provided in place of study halls, where students may read, listen to and view tapes, observe films and slides, work on self-teaching and self-appraising machines, use science and other equipment and participate in other more or less individual study activities. Provision would also need to be made for small working areas for individual pupils.

To date, only a very few schools have initiated the team-teaching program as proposed by Dr. Trump. Therefore, as yet there is no evidence as either to the effectiveness of the instruction conducted in this manner or to the relative cost of the maintenance of such a program as compared with current high school organization. Accordingly, the present dilemma in which educators now find themselves is whether new school buildings should be designed in accordance with the Trump recommendations as in the case of the Wayland, Massachusetts, High School or whether some compromise should be made which would not prevent later adoption of the program, while in the meantime permit the conduct of a conventional high school program.

In view of the present uncertainties, one would view with considerable concern the planning of educational facilities for secondary school use which are predicated entirely on a theory which has not yet been proven on this level. Accordingly, it would appear that the wisest plan would be to design a flexible building which would permit such future modification as might be necessary to allow the incorporation of the essential features of the team-teaching plan. This could be done without prejudicing the possibilities of the continuance of the present organization of instruction in the high schools, or restricting the opportunity for the eventual adoption of the newer plan.

In view of the foregoing, provision may be made in the standard secondary school plans for the adaptation of several of the large areas included in a modern school so that they may be used for large group teaching. Such spaces as are currently provided - music room, study room and cafeteria dining room and the auditorium - could easily be designed to serve a dual purpose. Standard classrooms in the building could be designed in such a way as to permit subsequent subdivision into two or three smaller conference rooms, while other standard classrooms could be planned to facilitate their development into resource centers. A building planned in this way would be economical in terms of initial cost but with relatively small additional expenditures could be adapted for effective use in the team-teaching program. Possible sub-divisions are illustrated in Exhibits 2 and 3.

In the development of the standard plan for a junior-senior high school, provision for the types of specialized spaces needed in a team teaching program has been made as follows:

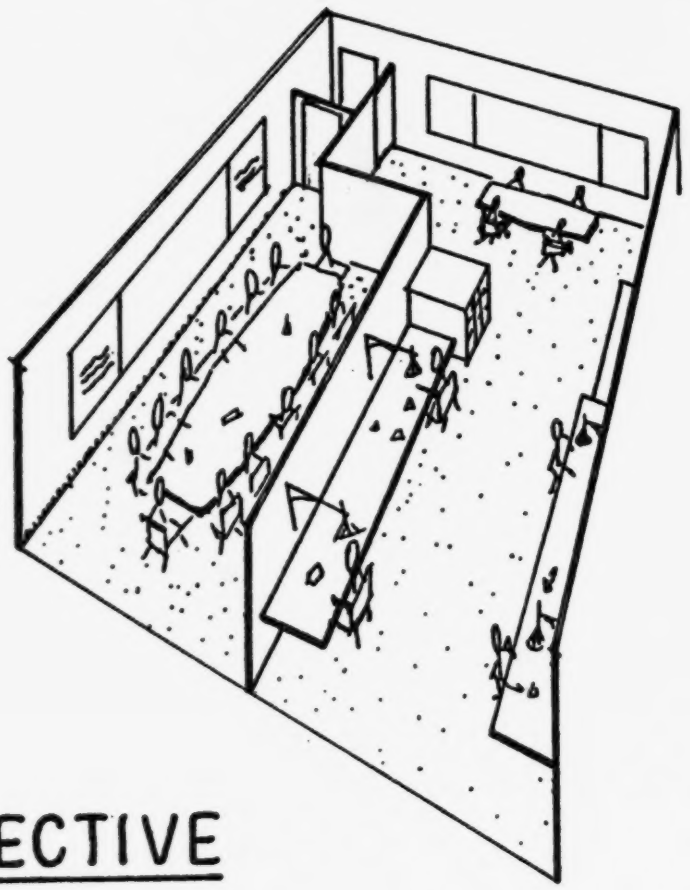
Large Group Spaces. Space available for use in the instruction of large groups could provide for the instruction of some 75 pupils while the larger spaces would accommodate up to 150 or more pupils when this is desirable.

The following 4 facilities have been designed for dual use with the original purpose taking precedence over subsequent possible use. In all, they would provide for 6 large group instructional areas.

Space	Size	Original Purpose	Capacity for Large Group Instruction
Music Room	910 sq.ft.	Instrumental & Choral Music	75
Audio-Visual	1170 sq.ft.	Television & Speech Center	75
Study Room	1050 sq.ft.	Pupil Study	75
Cafeteria	1@1360 sq.ft. 1@1824 sq.ft.	Pupil Dining Area	125 (each)
Auditorium		Assemblies	150 (plus)

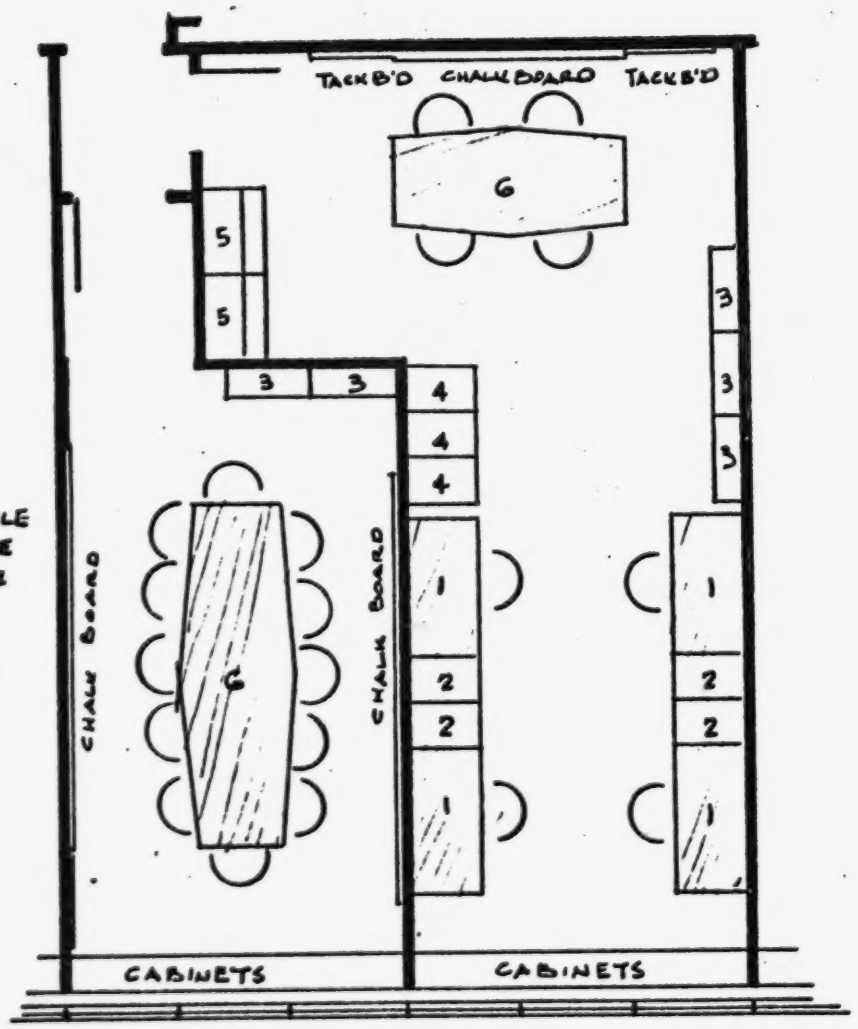
Special consideration has to be given to acoustics, especially where room dividers are used. Also essential services will be provided for the use of audio-visual equipment (including television) so as to be available when needed.

Medium Size Group Spaces. The standard classrooms of the building will serve the needs for the medium size class groups of 20-35 pupils each without any change from current design.



PERSPECTIVE

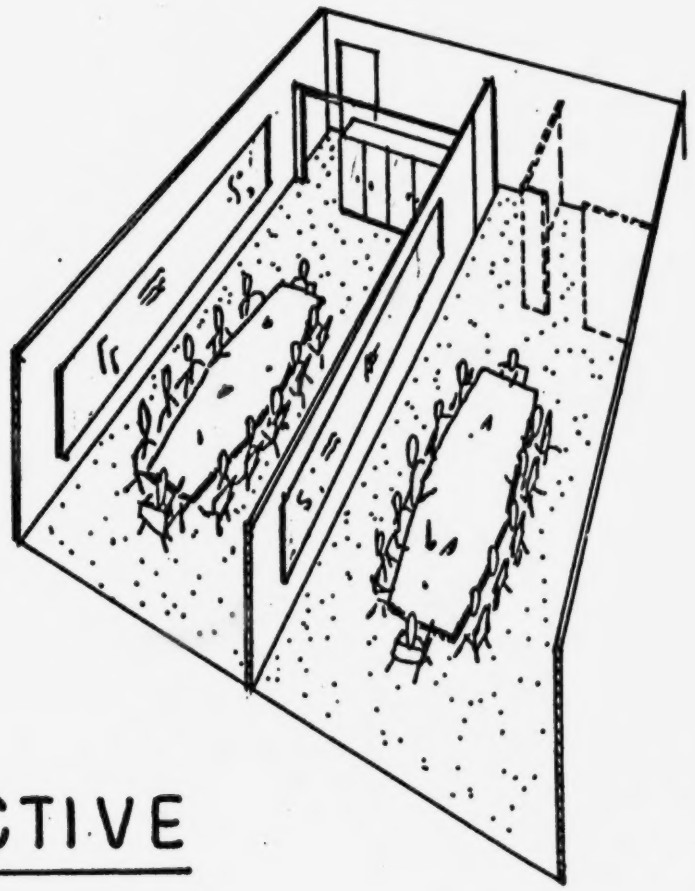
1. DESK
2. TWO DRAWER LEGAL FILE
3. ST'D 3'-7' BOOKCASE
4. 4 DRAWER LEGAL FILE
5. STD. CAB. BASE AND UPPER UNIT
6. CONFERENCE TABLE



PLAN

CONVERSION OF REGULAR CLASSROOM INTO TEACHERS PLANNING CENTER

EXHIBIT NO. 2



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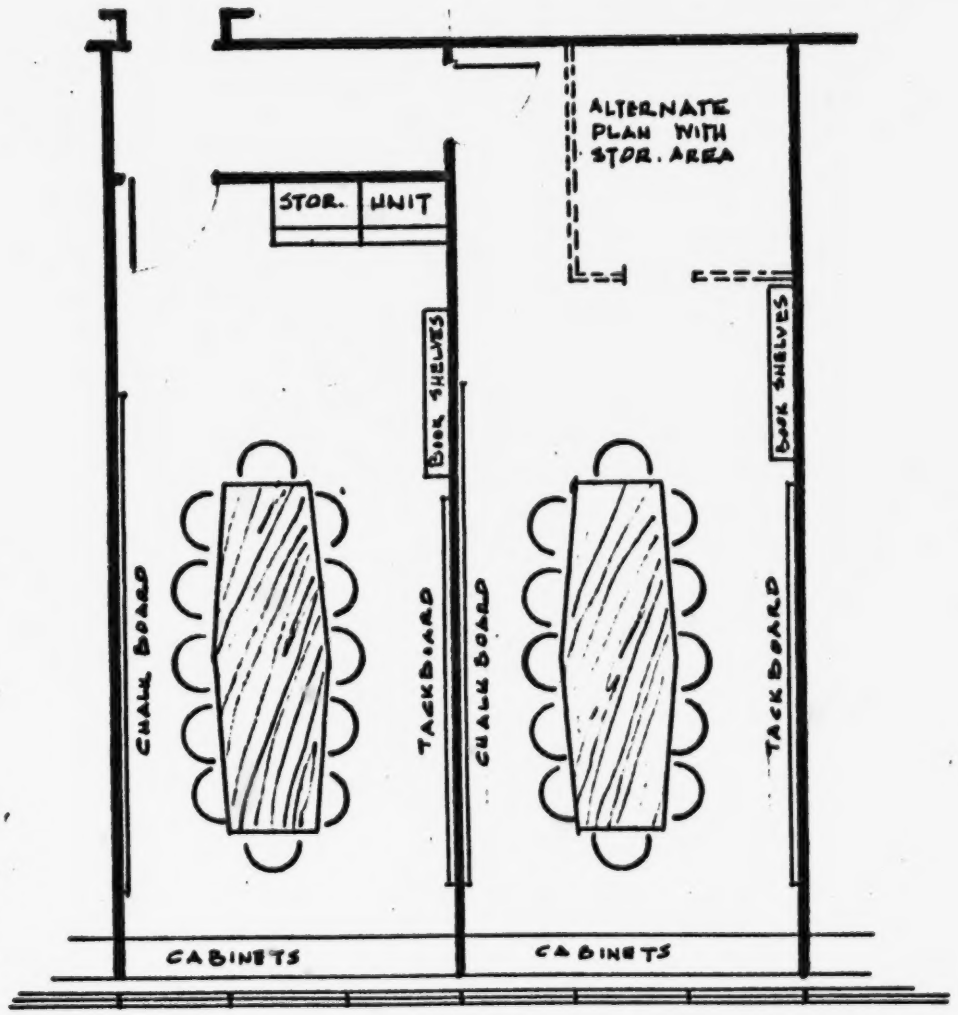


PLAN

CONVERSION OF REGULAR CLASSROOM INTO SMALL GROUP SEMINAR ROOM

EXHIBIT NO. 3

Small Group Spaces. Small group conference rooms, when needed, may be created readily through the partitioning of standard classrooms into two or three smaller rooms. In order that this may be done readily, both the room size and the window module have to be designed to accomplish this purpose. The use of bar joists for roof construction together with removable acoustic tile ceilings will permit rearrangement of fixtures and controls.

Resource Areas. Standard classrooms could easily serve as resource areas. Book shelf storage units could be readily installed as well as other types of special storage units, depending upon need. Individual pupil work alcoves may also be readily installed. (Exhibit 4)

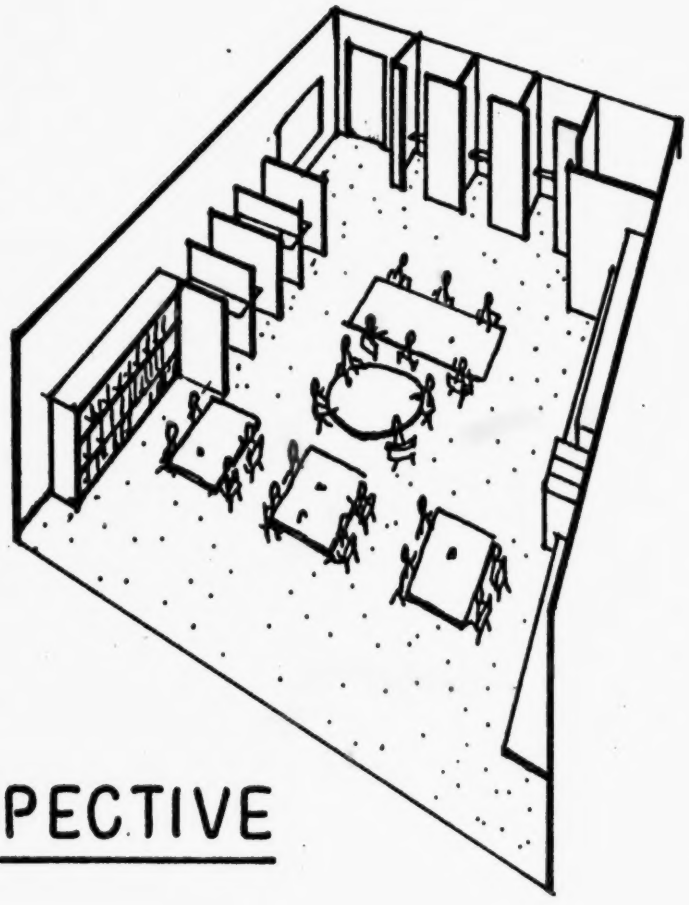
Teacher Work and Preparation Areas. These could also be developed readily from standard classroom units.

Provision for Teaching by Television

Recent years have seen a tremendous impetus given to the use of television as a teaching tool with a number of school systems undertaking experimentation with this new media of instruction. The Ford Foundation as well as the television industry have made substantial grants to schools and colleges for the conduct of studies in television education. In our own state, the Regents have developed an ambitious program of educational telecasts beamed to the schools. Thus far, however, research has not disclosed any particular superiority for this new media over that already demonstrated by other audio-visual media, as for example, the sound motion pictures. Further, intensive use of the educational television has already disclosed some of its limitations.

We do know that television is a powerful means of communication. This has already been amply demonstrated. It has served in a larger measure to promote more common learnings among the people of the country than any other educational force. The personal pleasure it has afforded undoubtedly makes it the most universally used leisure time recreational device we have today. Probably its most valuable contribution to the schools is its ability to bring current history into the classroom timed with the actual happening. For example, on the national scene the recent conventions of the great political parties, the debates of the Presidential candidates, and the inauguration are important moments of history that can be shared by pupils in the classroom. On the international scene, the recent United Nations meeting attended by world leaders give to pupils a dramatic demonstration of the great cleavage between the democratic and iron curtain countries.

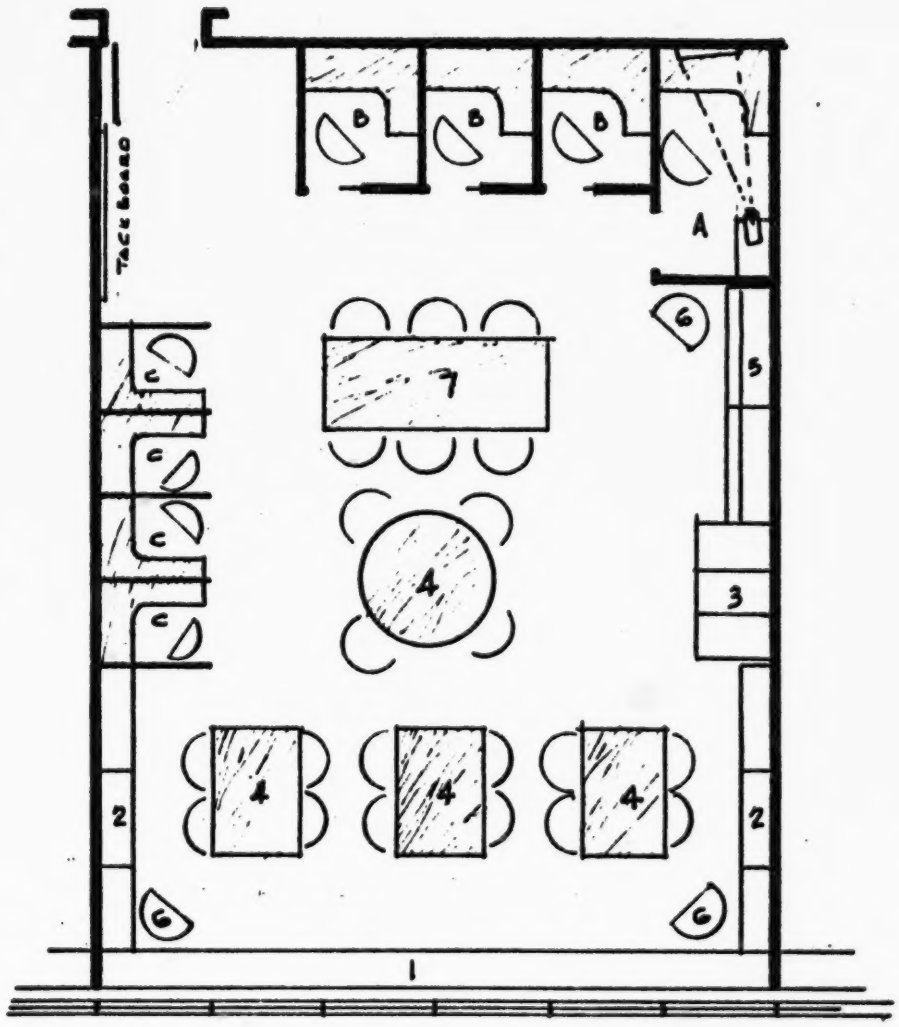
There is some question, however, as to the extent television may take the place of the classroom teacher as has been suggested by some writers. Because of the nature of the media, this would require the lockstepping of instruction in a manner which educators have studiously sought to avoid for many years. The



PERSPECTIVE

A. PROJECTION BOOTH
B. LISTENING BOOTH
C. INDIVIDUAL STUDY BOOTH

1. LOW BOOK SHELVES
2. HIGH BOOK SHELVES AND DISPLAY CASE
3. VERTICAL FILES
4. FOUR PUPIL TABLE
5. DISPLAY AND STOR. CASE
6. EASY CHAIR
7. SIX PUPIL TABLE



PLAN

CONVERSION OF REGULAR CLASSROOM INTO RESOURCE CENTER

EXHIBIT NO. 4

television lession cannot be planned easily to meet simultaneously the needs of slow, average and bright classes. Even more important, it cannot provide the kind of step-by-step check of the learnings which the teacher is able to do. There is no practical way of stopping at a given point in the lesson to amplify points which appear to trouble pupils. Utilization of this media presents difficult scheduling and timing problems whose solutions although not necessarily insoluble often creates artificial situations.

Many of the educational television programs are recorded on kinescopes for future use. This is a very desirable and efficient use of well prepared programs since they can be used with standard 16mm sound film projectors at any time in any room. These films when projected on a large screen will be much easier to see than on a relatively small television screen.

However, in spite of certain apparent limitations of the educational television as it exists today, school planners must recognize that future developments both in the arts and in the science of television may serve not only to overcome some of the current limitations but to open up new areas of opportunity. In view of this, certain specific provisions have been made to permit the following:

1. Receipt of telecasts broadcast by educational and other television stations.

2. Utilization of closed circuit telecasts originating from off-site locations.

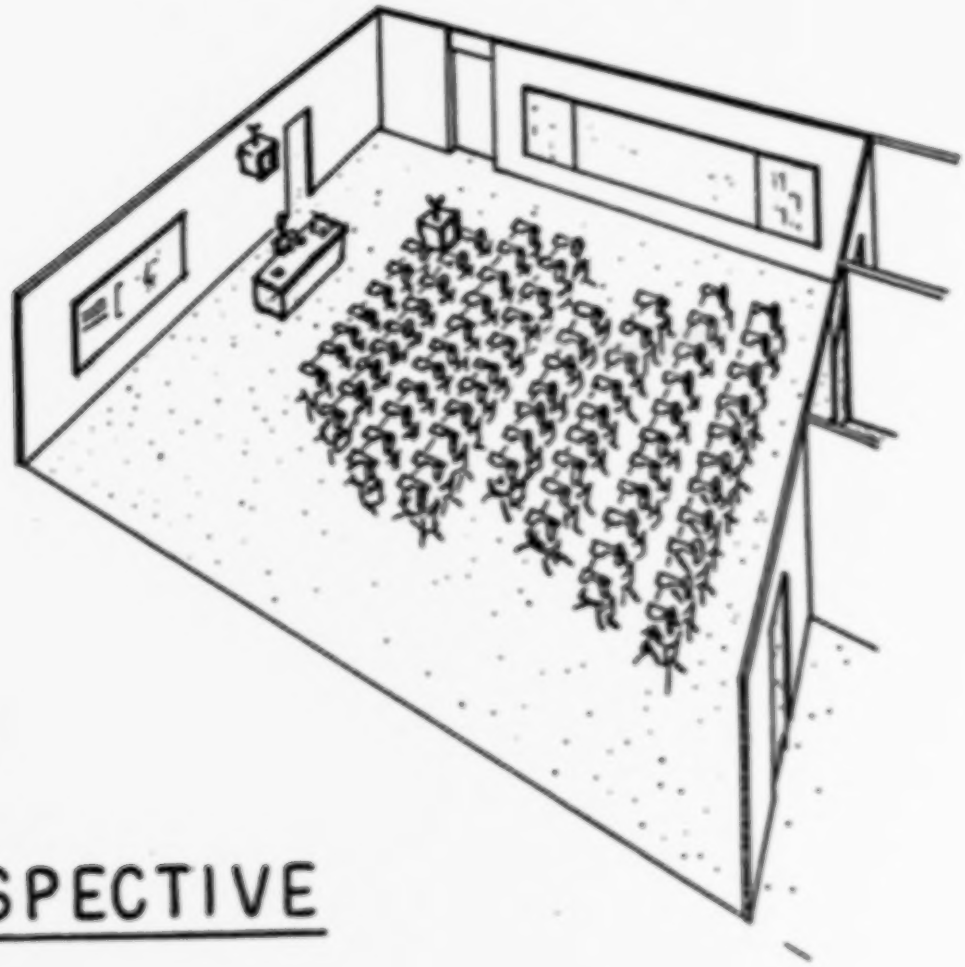
3. Origination of programs within the school for closed circuit transmission within the building as well as use of kinescopes and television tapes.

For this purpose, a system of conduits are planned for the necessary circuitry. Provision will also be made for the installation of a master antenna for the receipt of remote programs. Also, a television center has been included in the audio-visual room for both the origination of programs as well as the use of kinescopes and tapes. The audio-visual room itself is large enough to serve as a regular classroom as well as a speech room until such time as its use as a television studio is indicated.

CERTAIN FEATURES OF THE PLAN

Electronic Teaching Center - Exhibits 5 & 6

One of the features of the plan is the development of an Electronic Teaching Center with five separate units in which are localized a variety of the newer electronic teaching devices in addition to the more conventional types of audio-visual instruction equipment. Included in this Center are the following units:



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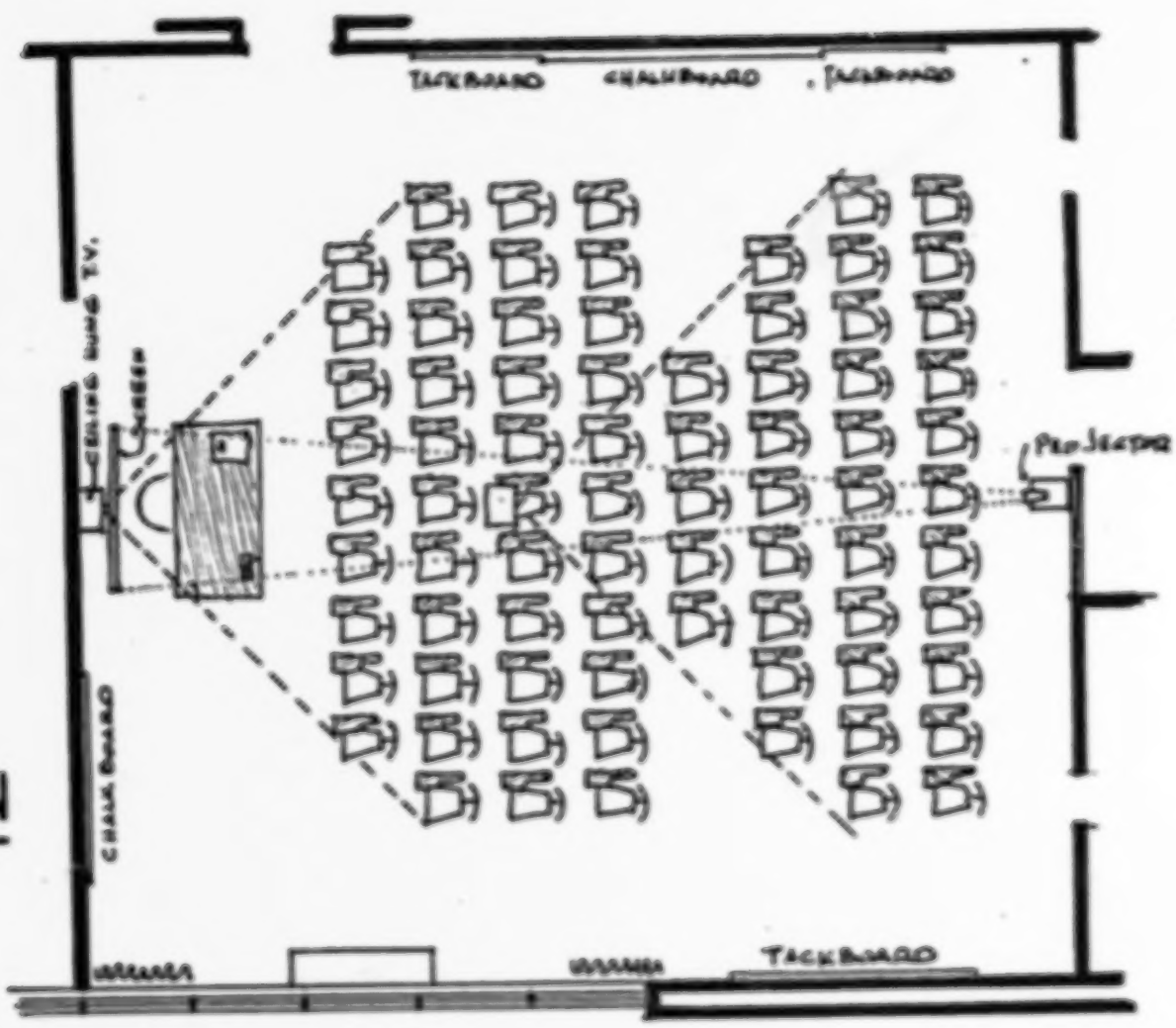
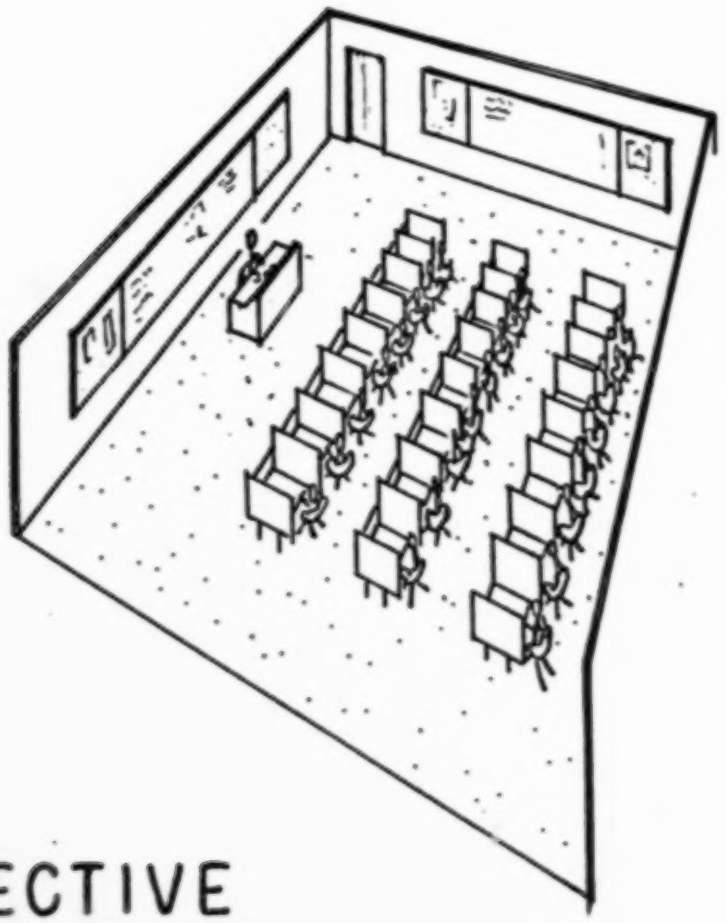


PLAN

ELECTRONIC TEACHING CENTER

EXHIBIT NO. 5



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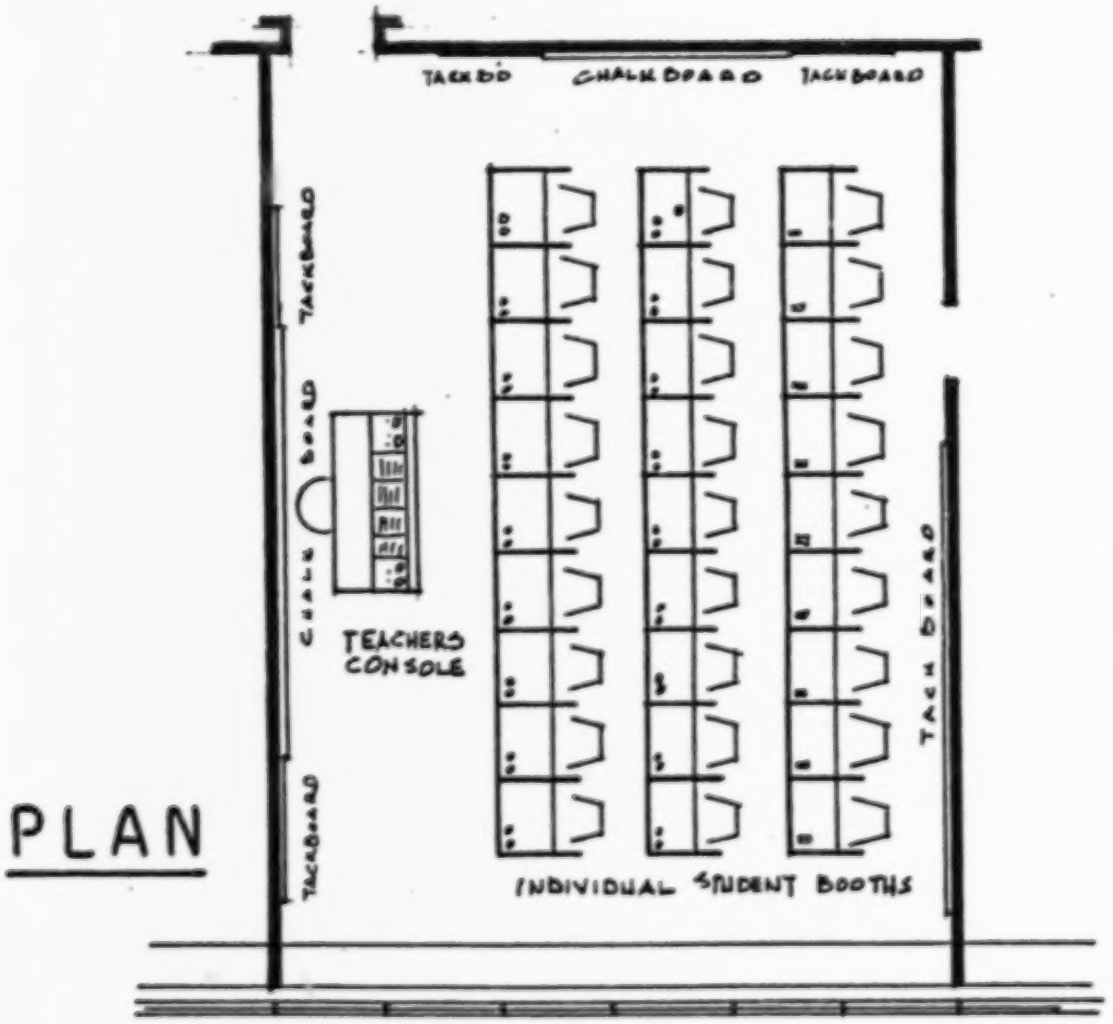

PLAN

FOREIGN LANGUAGE LABORATORY

EXHIBIT NO. 6

1. Foreign Language Laboratory
2. Combination Television Studio and Speech Center
3. Television and Public Address Control Room
4. Audio-Visual Library and Workshop
5. Storage Rooms for Equipment

Within the Electronic Teaching Center the following types of educational activities may be conducted:

1. Teaching of foreign languages by the Oral-Aural method
2. Clinical work in speech making use of tapes
3. Origination of telecasts for closed circuit transmission to various rooms
4. Transmission of programs for kinescopes or television tapes
5. Monitoring television and radio programs originating from outside points
6. Instruction through the use of films, slides, etc.
7. Distribution center for films, filmstrips, slides, tapes, records, etc., as well as projection, reproducing and recording equipment
8. Storage and repair of audio-visual and electronic equipment
9. Small meeting room for evening activities

The Oral-Aural Approach to Foreign Language Teaching

The success of the oral-aural approach in the teaching of foreign languages as functional tools has been well demonstrated. It is considered important, therefore, that in planning a new secondary school provision be made for a language laboratory facility. The standard plans which have been developed include such a facility as a part of the electronic teaching center. The classroom adjoining the audio-visual room will have the requisite conduits to permit the later installation of control console and pupil booths.

Programmed Learning Through Auto-Instructional Devices

Although it is not possible to gauge at this time the eventual effect of programmed learning through the medium of auto-instructional devices, limited application thus far have indicated considerable potential. This area is so new that its possible impact on school design has not yet been assessed. However, since the underlying principle of this method is individual activity, it is conceivable that its most effective exploitation could come through the provision of individual study areas. This would suggest the creation of small open cubicles or work areas with a section of shelf or counter on which to place the teaching machine. Such cubicles could be placed along the sides of small rooms created by the subdivision of standard classrooms. Thus, the smaller conference rooms mentioned in the plans for team teaching could well serve this purpose if and when the machine teaching were adopted.

Arts Unit

The plan provides for the close association of those educational facilities essential for the fine and practical arts and the dramatic and musical arts. They are clustered near the auditorium to provide for the maximum of integration. Music facilities are planned adjoining the stage to facilitate rehearsals as well as provide dressing room space for small and large groups.

REASONS FOR ARCHITECTURAL PLAN AND DESIGN

Plan

The efficacy of a standard plan depends on many factors such as ability to meet unknown and variable site conditions, environment, budget limitations and teaching methods. This latter factor has been hereinbefore set forth in more detail under the Provision for Changes in Teaching Methods. A conservative approach has been considered desirable, particularly in view of the mandatory basic requirement that the structure be limited to one story. Maximum utilization of all programmed areas with a minimum of non-educational areas was considered essential in order to meet the factors of cost and site. Consequently, the attractive but costly single load corridors were eliminated. The main corridor, however, has been widened at the auditorium, cafeteria and library and gymnasium in order to provide areas for intermingling of students, facilitating traffic and adding to the attractiveness of the long corridor. The campus type or extended type of plan was discarded because of the cost and possible site limitation.

The solution finally adopted is the result of numerous studies of the problem. The basis of the solution lies in the segregation of the junior and senior high school academic units with the special units conveniently located so that both junior and senior groups will not intermingle so far as the classrooms are concerned. The plan may be considered as a modified campus type in that the major units are segregated to a certain extent.

It is a functional plan in many respects: almost complete segregation of junior and senior pupils; centralization of major units used separately or jointly by both junior and senior pupils; accessibility for public functions, as well as blocking off of areas not required for such functions; ease of traffic.

In addition to keeping the over-all plan within reasonable bounds, two main frontages have been designed that should allow more latitude in locating the building with relation to highways, topography and orientation. Separation of buses and private cars was considered to be desirable. Location of the gymnasium and locker rooms will permit location and development of the athletic field and play areas at either of the remaining two sides or both without crossing of the service or access driveways.

Atypical shaped classrooms have been avoided because of the increased cost and unsuitability for a standard plan that must meet the educational needs of many school districts which cannot afford to experiment.

Design

The design of any object, whether it be a work of art or a building structure, is not an arbitrary thing. It is a matter of personal taste. Consequently, architectural design is subject to change in order to meet the trend in vogue at the time of construction. Today, the prevailing style is called Contemporary.

Inasmuch as school buildings are built for long life, moderation should be a major factor. Illogical or extreme design features should be avoided. Simplicity as a result of elimination of frills is in accordance with the present-day trend and will always be in good taste when any new trend develops. For this reason, as well as economy, a contemporary design has been selected. Composition of the mass has been given major consideration in developing the over-all plan. The use of color is another feature of the design.

PROVISIONS FOR FALLOUT PROTECTION

The dual use fallout shelter included in this school was developed by the D.P.W. in cooperation with the Education Department and can be utilized in a variety of ways to augment the school program and the affairs of the community. Suggested functions which the shelter space might serve are: meetings of scouts groups on all age levels, meeting of other community organizations and school purposes such as student government quarters, publication rooms, recreation, areas for a variety of remedial purposes, administrative offices, large group instruction and audio-visual activities.

The plans for the shelter are architecturally and mechanically complete with the exception of the structural design for the sub-grade work. This work is to be completed by the adapting architect to meet whatever the existing soil conditions might be.

The size of shelter space, the capacity of the mechanical systems, and the provisions for food and water storage are based upon the expanded capacity of the school with a proper allowance for teachers and staff. Any special conditions which will affect the capacity of the school will require changes in these factors of the fallout shelter design.

The location of the shelter under the building was made to obtain the best protection at the lowest possible cost. A change in the location of the shelter will necessitate additional shielding design. Shielding has been obtained by both separating with distance and with mass, the planes on which radioactive particles will rest in relation to the shelter area. It is to be noted that any dimensional or material changes in the area

above the fallout shelter may affect the shelter design. For this reason the minimum mass of the interior partitions, floor construction, and total overhead construction upon which the shelter calculations have been based are indicated on the drawings. If materials of lesser mass then the tabulated values are used redesign of shelter will be required. It also has been assumed in the calculations, that finish grade is never below the bottom of the first floor slab around the shelter area. It is, therefore, necessary to maintain this grade in order to avoid redesign of shelter.

The shelter plan indicates emergency water supply in a group of tanks within adjacent crawl space. Wherever an adequate supply of well water can be obtained it is suggested that the adapting architect substitute it as the fallout shelter water supply. The plans show self-contained toilet facilities in the form of sanitary tanks fitted with toilet seats. Wherever a septic tank and leaching field are available and the supply from the well is adequate, it is suggested the adapting architect substitute a system using periodic flushing of waste. Generator capacity should be checked, however, to be sure that an adequate power supply is made available, during the emergency period, for these possible substitutions.

The shelter area is designed for a minimum protection factor of 100 by use of "Design and Review of Structures for Protection from Fallout Gamma Radiation", an official Office of Civil Defense, Department of Defense Publication. In this respect it meets requirements of the New York State Civil Defense Commission.

Any changes to the shelter as specified and shown on the drawings should be discussed with and approved by the New York State Civil Defense Commission.

MODULAR DIMENSIONING

Modular Dimensioning, sometimes called Modular Coordination, is an orderly means of dimensioning, worked out to replace the haphazard method of measurement that has been generally followed in the building industry. There are only three fundamentals - the use of a dot, an arrow and a grid. The grid consists of a series of 4-inch modules whereby reference lines with grid locations make it possible to use arrow-heads as basic dimensioning elements to show where a 4-inch increment will fall in the structure or a dot indicating that it is an actual dimension but not a modular dimension. These grids are used for plans, elevations and details. Many manufacturers of materials and equipment are now using modular dimensioning and this method is growing rapidly. The grid is of greatest use when applied to masonry unit construction.

Modular Dimensioning has been used because of at least three definite benefits that accrue to the owner's account: (1) Economy, (2) Speed, (3) Better work. The entire project is coordinated. There is less waste of materials and time required in cutting units. Modular is much easier

for the workmen. More contractors are attracted to bid because estimating is faster, easier and more accurate.

PROVISION OF FACILITIES FOR PHYSICALLY HANDICAPPED

Provision has been made in the plans for one wheel chair toilet stall in each academic wing for the boys with the same provision for girls. One of the two drinking fountains in each academic wing will be installed at a 30-inch height. It has been assumed that the physically handicapped will arrive in private cars and consequently a ramp has been provided at the end of the main entrance shelter and mullions have been omitted for the main entrance double doors which enclose a heated vestibule.

FUTURE MODERNIZATION AND EXPANSION

In addition to provision for changes in teaching methods, provision must also be made for future modernization and expansion. These changes are architectural and structural. Whereas the plans and specifications have incorporated present day methods of construction and selection of materials consistent with durability, low maintenance, appearance and reasonable first cost, new materials and new methods of construction as well as changes in teaching methods may require structural changes and possibly modernization of room spaces and equipment. Obviously, future modernization and the extent of same cannot be determined at this time but they have been anticipated in the general over-all planning, selection of steel skeleton construction in place of wall bearing so as to permit non-load bearing partitions and elimination of plaster wall finish.

Whereas the present plan provides for an initial enrollment of 800 pupils, the cafeteria, library, auditorium and physical education units - all planned for the maximum enrollment of 1000. The expansion required for teaching 200 additional pupils can be achieved by adding to the ends of the wings as shown on Exhibit 1. Provision has been made in the mechanical and electrical plans and specifications for future expansion.

SELECTION OF CONSTRUCTION AND FINISH MATERIALS

Construction

Type of construction and materials specified for construction and finish have been selected for safety, appearance, quality and durability and low maintenance cost with due consideration for reasonable initial cost. They are considered to be minimum. Betterments can be made, if funds are available, by specific substitutions for materials specified as well as additional items considered to be advantageous such as acoustic tile ceilings, plastered wall surfaces, glazed materials when subject to abuse as well as normal wear and tear, aluminum window frames and sash, etc. Such betterments will improve the appearance and, more importantly, will reduce maintenance and ultimately result in

savings sufficient to pay for the additional cost. Modifications in the plans and specifications can be made by the adapting architect (mentioned hereinafter) at a reasonable cost.

Continuous window-wall panels were adopted because they are prefabricated off the site during the fabrication and erection of the structural steel. The reduction in masonry and substitution of window-wall panels permits early enclosure of the building thereby expediting the progress of all prime contracts.

The remaining exterior walls generally are cavity-type consisting of face brick on the exterior, 2-inch air space and 6-inch concrete facing block parged with waterproofed cement coating. This type of exterior wall construction has been thoroughly tested and assures a weathertight insulated masonry wall if the air space is kept clear of mortar droppings and weepholes are provided at the bottom of the cavity. Selected common brick has been specified for economy. However, an alternate for a standard face brick may be included.

Insulated plank laid over steel joists will serve the dual purpose of insulation against heat and cold and acoustical treatment. The steel joists will remain exposed and painted a light neutral color to make them less conspicuous. A 20-year bonded built-up roof is specified.

Interior walls generally will be concrete facing block with combination steel door frames and trim. Exterior steel door frames and hollow metal doors are specified.

Exterior window frames and sash are likewise specified. Where local climatic conditions permit, aluminum may be considered as an alternate. Aluminum eliminates painting and reduces maintenance.

Finishes

Concrete facing block will be painted except for corridors, locker rooms, food service and toilet rooms which will be finished with a vitreous enamel surfacing wainscot height.

Where called for on Finish Schedule, ceilings will be acoustic tile.

Floor finishes will include asphalt tile, vinyl asbestos tile, ceramic tile, quarry tile and wood as required for specific purposes and called for on Finish Schedule. If funds are available, terrazzo may be substituted in certain areas such as corridors and cafeteria for durability, low maintenance and appearance.

APPROACH TO STRUCTURAL DESIGN

One of the chief factors in the construction cost of any building is efficiency which involves the time factor. Experience has proven substantial cost savings where construction methods and materials permit speedier construction by all trades.

The relative merits of wall bearing versus steel or reinforced concrete skeleton construction have been carefully analyzed. There is a divergence of opinion among builders and architects on this matter. However, steel skeleton construction was adopted for the following reasons:

1. Reinforced concrete requires job labor for formwork and pouring of concrete over a comparatively long period of time.

2. Reinforced concrete is subject to weather conditions, particularly temperature changes.

3. The various members of the steel framework can be prefabricated off the site during the period of excavation and foundations.

4. Erection of the structural framework is expeditious and can be completed in a comparatively short period of time.

5. Insulated plank decking over open web joists supported by rolled steel beams permits wide spacing of joists reducing cost and resulting in early completion of the roof.

6. Completion of the roof will allow exterior and interior masonry work to proceed concurrently.

7. Mechanical and electrical trades can likewise proceed regardless of weather conditions.

8. Economical and structurally sound method of adding to structural members.

Structural steel is non-combustible and meets the New York State requirement for Class A structures. Insurance ratings are reduced and the maximum period for the bond issue is assured. All materials are open to competitive bidding and are manufactured widely by different concerns. Job labor and overhead costs are reduced.

HEATING AND VENTILATING

Ventilating and Heating System

The heating system is a two (2) pipe forced circulation of hot water selected for its flexibility since site locations may dictate locations of heating mains in either first floor corridor ceilings or in crawl spaces below first floor. The heating

systems are provided with capped connections at the extreme end of all wings for future extensions.

Boiler Plant

Two (2) packaged type oil fired boiler-burner units are the heating medium with space provided for a future boiler. Oil firing was selected basically because of the fact that generally fuel oil is more economical to operate than other fuels.

Classroom Heating & Ventilating

Classrooms are heated and ventilated by means of unit ventilators selected over other methods such as open window ventilation, forced hot air, radiant slabs, etc., because of the positive results obtained. Unit ventilators are automatically controlled so that certain amounts of fresh air are introduced dependent upon outside temperatures.

Auditorium, Gymnasiums, Locker Rooms & Other Similar Spaces - Heating & Ventilating

These spaces are heated and ventilated by means of forced circulation of hot and/or tempered air. This method was selected because of the large amounts of air that are required for high occupancy spaces. Systems provided are automatically controlled in the same manner as for classrooms.

Exhaust Ventilation

Spaces such as kitchens, toilets, janitor's closets, chemistry room, science rooms, shops, etc., are exhausted by means of positive systems to the atmosphere.

Thermostatic Control

A dual system of individual room thermostatic control is provided for economical operation of the heating and ventilating system. The controls are so arranged that during limited night use of the building, heating can be provided for occupied rooms and spaces only while the balance of the building is maintained at a lower temperature setting. This arrangement does not limit night use to any particular area or space.

SANITARY

Plumbing System

The plumbing systems including sanitary sewer; storm water; hot, cold and circulating lines; provide all necessary connections to plumbing fixtures in accordance with New York Standard State Code. Services for the building are flexible with modifications for particular sites. Plumbing piping has been designed with

capped connections at the extreme end of all wings for future extension.

Gas & Acid Waste Systems

Gas and acid waste systems are provided for all special rooms such as chemistry, science, shops, etc.

Provision has been made for the physically handicapped pupils such as w.c. stalls and drinking fountains.

ELECTRIC WORK

In considering the electric work for this project, it was necessary to proceed with certain basic assumptions since the location of the school is not fixed. The design is therefore predicated on certain standards which are generally available and accepted for school building construction. All electric facilities including services, panel boards, feeders, button boards for communication and signalling, etc., have been provided with space capacities to permit expansion of all of the systems.

Service

The primary service available and the design of transformer vault facilities depend on the local power company. However, it is generally accepted that 120/208 volts, three phase, will be made available for distribution within the structure and this has been made a part of the design. This system is the most flexible and most economical available.

Fuses

The use of fuses has been avoided as far as is practically possible and circuit breakers have been provided as the general basis for wiring protection. Fuses will be used however in the service switch, in certain signal control apparatus, in some power control circuits, and in a few cases, in motor control circuits. Limiting the number of fuses will reduce the maintenance costs and avoid the danger of over-fusing with its consequent fire hazard.

Outlets

Convenience outlets for the connection of portable equipment have been provided at all reasonable locations required. Outlets for floor polishers and scrubbers are provided in all corridors at intervals of about 50 feet as well as in large areas such as auditorium, gymnasium and cafeteria. Outlets in Typing and Secretarial Practice Rooms are under the control of master switches with pilot indicators so that machines will not be left running after room occupancy has ended. Outlets are provided near the windows of the Administrative Suite for possible connection of air-conditioning units.

Underfloor Ducts

A system of grid type underfloor ducts has been provided for the Industrial Arts areas to achieve maximum flexibility as the majority of instructions in this field are not completely satisfied with layouts prepared by others.

Lighting

Lighting is generally of the fluorescent type for all classrooms, offices and other seeing spaces. This form of lighting has been found to be the most efficient for this purpose providing good lighting intensities at relatively low cost and with virtually shadowless effects. In addition, the long life of the lamp reduces costs of replacement.

Fire Alarm

The fire alarm system is of the general alarm, master (common) coded type, electrically supervised. This will assure the operation of the system when it is needed, will sound the alarm on all signals, and will indicate the station which originated the alarm. In addition, we have made provision for connection to municipal fire headquarters either through a master auxiliarized station or through a leased telephone line if such connection proves deisrable.

Sound

The sound system will provide the multiple functions of a public address system and an intercommunication system. This will provide for the greatest economy. However, bell signals will be provided for normally high noise levels such as music rooms, gymnasium, shops, auditorium, cafeteria and the exterior. A separate telephone system is often provided but it has been found that this system frequently is abused because of the privacy feature. The semi-public form of conversation provided through the public address loudspeaker will discourage its use except for official purposes.

Television

The system provides for connection of receivers for use on either "off-the-air" programs through a master antenna or for closed circuit programs. The value of this educational medium is more fully discussed in the notes of the educational consultant.

Emergency Service

In addition to the normal emergency lighting provided for spaces used for assembly, a portion of the building circuitry has been designed to permit the connection of a portable generator, in the

as well as economy, a contemporary design has been selected. Composition of the mass has been given major consideration in developing the over-all plan. The use of color is another feature of the design.

ADDITIONAL ARCHITECTURAL AND ENGINEERING SERVICES

The services of an adapting architect are essential for the completion of the construction drawings and specifications insofar as they concern the site adaptation, sub-soil structure, foundation plan, service utilities, checking of shop drawings, approval of materials, construction supervision, amendments due to local requirements and the necessary addenda to the standard specifications to cover all modifications desired by the local Board of Education.

In addition the adapting architect can assist the school board in the bidding procedure, investigation of low bidders, checking of monthly requisitions, checking and approving of change orders, approval of subcontractors, correspondence with contractors and similar professional duties recommended by the American Institute of Architects. The adapting architect can also make certain that the plans and specifications are fulfilled and first class materials and workmanship are furnished by the contractor.

It is to be noted that these professional services are for the protection of the client, which in this case is the School District.

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